

Botanical nomenclature



1. Nomenclature
2. Need for scientific names
3. Latin usage
4. Development of Botanical code
5. Latest botanical codes
6. Principle of ICBN
7. Ranks of taxa
8. Naming of taxa
9. Genus taxa
10. Species taxa
11. Infraspecific taxa
12. Type method
13. Author citation
14. Publication of names
15. Effective publication
16. Rejection of names
17. Principle of priority
18. Limitations of principle of priority
19. Nomina conservanda
20. Conservation of names of species
21. Names of hybrids
22. Names of cultivated plants

- **Nomenclature** deals with the application of a correct name to a plant or a taxonomic group
- Nomenclature is combined with identification, since while identifying an unknown plant specimen, the author chooses and applies the correct name
- The current activity of botanical nomenclature is governed by the **International Code of Botanical Nomenclature (ICBN)** published by the **International Association of Plant Taxonomy (IAPT)**



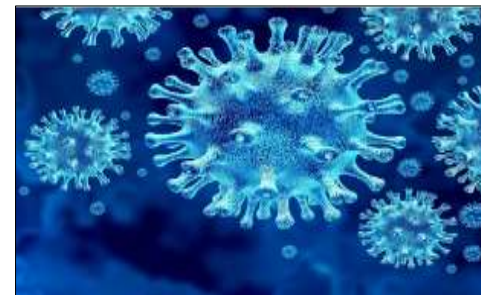
Scientific naming of Plants, Algae and Fungi are based on Rules and Recommendations of **International Code of Nomenclature (ICN)**



Naming of cultivated plants is governed by the **International Code of Nomenclature for Cultivated Plants (ICNCP)**



The naming of Bacteria is done by the **International Code for the Nomenclature of Bacteria (ICNB ; now known as Bacteriological Code- BC)**



Virus nomenclature is governed by the **International Code of Virus Classification and Nomenclature (ICVCN)**



Need for Scientific names

- **Vernacular names** are not available for all the species known to man
- Vernacular names are restricted in their usage and are applicable in a single or a few languages only. They are not universal in their application
- Common names do not provide information indicating family or generic relationship
- In widely distributed plants, many common names may exist for the same species in the same language in the same or different localities
- Often two or more unrelated species are known by same common name
- Cause confusions among taxonomists of different parts of globe



Common name: *Drumstick tree*

Regional vernacular name:

Nuggekayi (Karnataka)

Usilai (South Tamil Nadu)

Thurinji (North Tamil Nadu)

Malunggay (Philippines)

Why Latin ?

Latin

lingua Latina, Latinum^[1]



Latin inscription on a stone inside the
Colosseum in Rome, Italy

<https://en.wikipedia.org/wiki/Latin>

- Latin is dead language and as such meanings and interpretation are not subject to changes unlike English and other modern languages
- Latin is Scientific and exact in meaning
- Grammatical sense of the word is commonly obvious
- Latin language employs the Roman alphabet, which fits in the text of most languages

Development of Botanical Code

- The **International Code of Nomenclature for Algae, Fungi and Plants (ICN)** also known as the **Botanical Code** is a set of Rules and Guidelines for naming and classifying Plants, Algae and Fungi
- For several centuries, the names of plants appeared complex as polynomials
- **Casper Bauhin (1623)** introduced concept of Binomial Nomenclature under which the name of species consists of two parts. The first name of the genus and second name of Specific Epithet
- **Carolus Linnaeus** firmly established this system of naming in his ***Species Plantarum*** (1753)
- The early rules of nomenclature were set forth by Linnaeus in his ***Critica botanica*** (1737) and further amplified in ***Philosophica botanica*** (1751)
- The first organized effort towards the development of uniform botanical nomenclature was made by **Alphonse de Candolle**, who circulated a copy of his manuscript ***Lois de la nomenclature botanique***.
- The first **International Botanical Congress (IBC)**
 - Held in Paris (1867) – The Paris Code also known as 'de Candolle Rules' was adopted



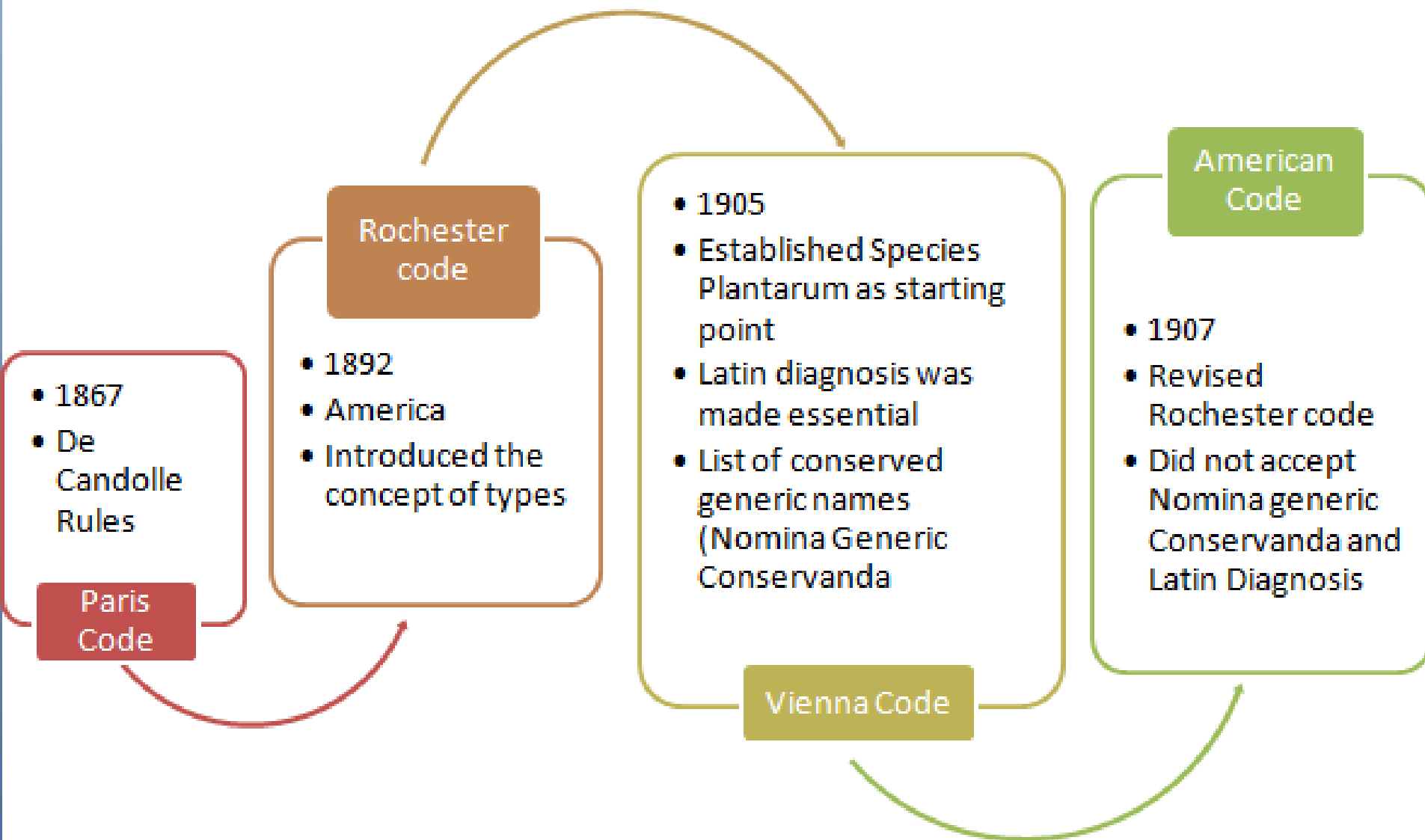
Casper Bauhin



Carolus Linnaeus



Alphonse de Candolle



Cambridge code (1930)

- Difference finally resolved
- Truly International Code evolved
- Accepted the concept of Type method
- Rejecting tautonyms
- Making Latin diagnosis mandatory for new groups and approving conserved generic names

The Code has since been constantly amended at each International Botanical Congress

15th IBC- held in Tokyo in 1993

16th IBC- held in St. Louis in 1999

17th IBC- held in Vienna in 2005

18th IBC- held in Melbourne in 2011

19th IBC- held in Shenzhen, China in 2017- Shenzhen code published in 2018

20th IBC- held in Madrid, Spain in 2024- Madrid code published in 2024

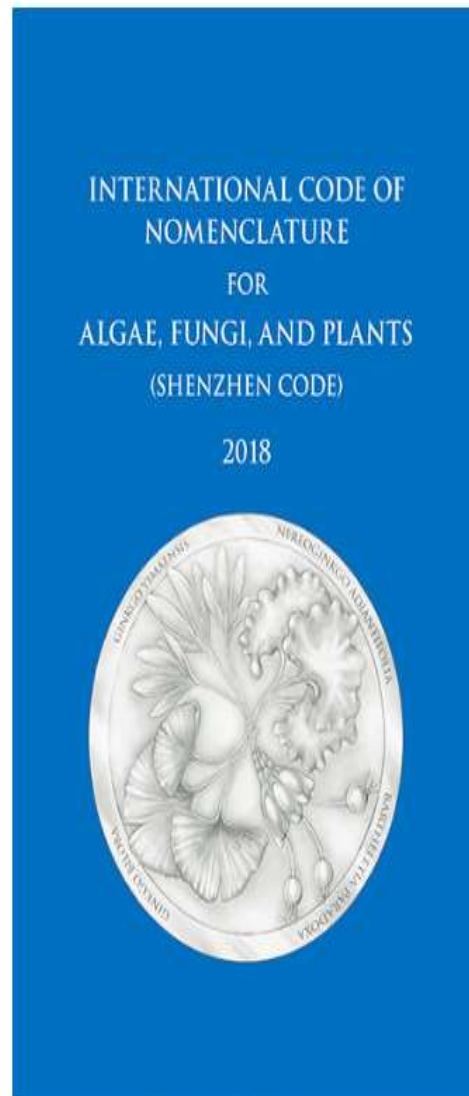
Highlights and features of Latest code

Shenzhen code

- Refers to the International Code of Nomenclature for Algae, Fungi and Plants
- Adopted by the 19th International Botanical Congress in Shenzhen, China
- July 2017
- Code includes,
- Standardized system for naming and classifying algae, fungi and plants, ensuring clarity and consistency in botanical nomenclature
- Outlines rules for naming new species, typifications and resolving nomenclatural disputes, promoting stability and universality in botanical names
- Specifies requirements for valid publication of new names, including electronic publication and language guidelines
- Clarifies rules for designating and conserving types, essential for establishing and stabilizing names
- Provides guidelines for authorship and citation of plant names, promoting accuracy and consistency
- Developed through international collaboration, ensuring the code is widely accepted and applied
- Available in multiple languages, including English, Spanish and French facilitating global use and understanding
- Accessible online, enabling easy access and updating of the code

INTERNATIONAL CODE OF
NOMENCLATURE
FOR
ALGAE, FUNGI, AND PLANTS
(SHENZHEN CODE)
2018





International Code of Nomenclature for algae, fungi, and plants

The Shenzhen Code of 2018 has been superseded by the [Madrid Code of 2025](#)

The *International Code of Nomenclature for algae, fungi, and plants* is the set of rules and recommendations that govern the scientific naming of all organisms traditionally treated as algae, fungi, or plants, whether fossil or non-fossil, including blue-green algae (*Cyanobacteria*), chytrids, oomycetes, slime moulds, and photosynthetic protists with their taxonomically related non-photosynthetic groups (but excluding *Microsporidia*). Before 2011 it was called the *International Code of Botanical Nomenclature* (ICBN).

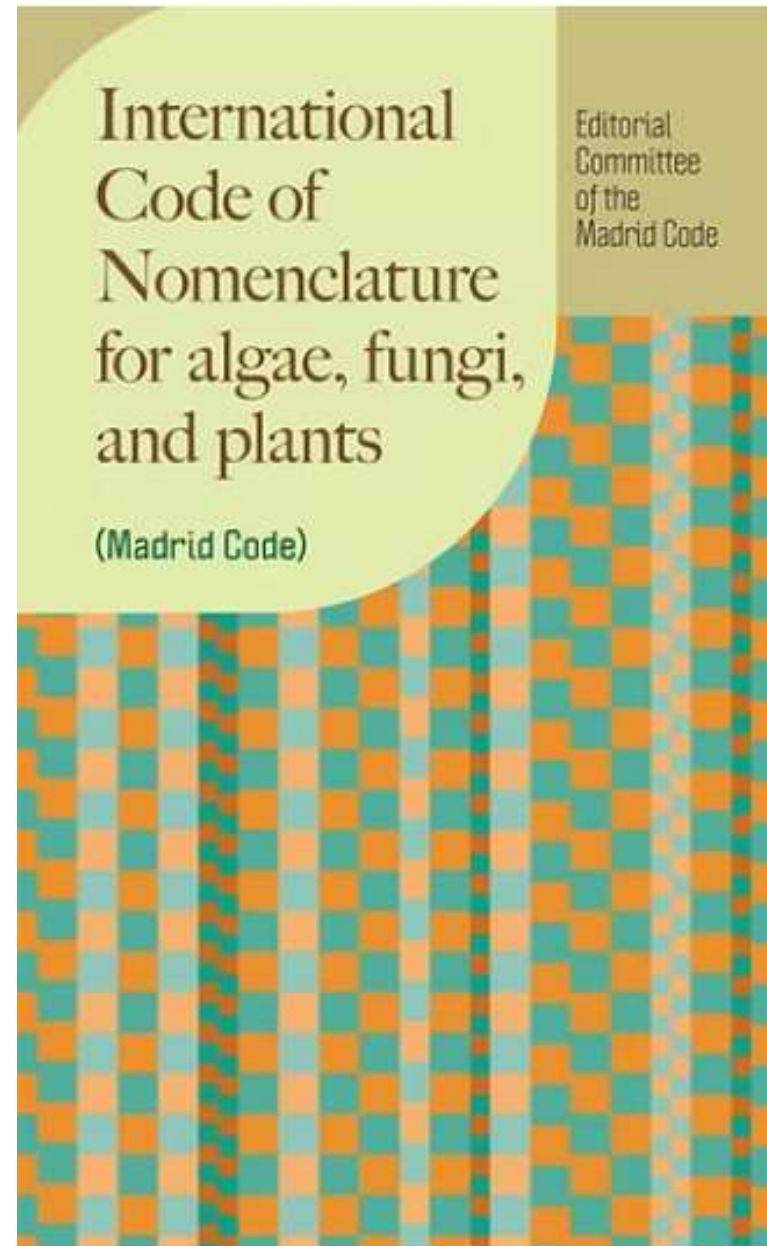
This edition of the *Code* embodies the decisions of the Nomenclature Section of the XIX International Botanical Congress (IBC), which took place in Shenzhen, China in July 2017. This *Shenzhen Code* supersedes the *Melbourne Code* (McNeill & al. in *Regnum Veg.* 154. 2012), published after the XVIII IBC in Melbourne, Australia in 2011. The rules of the *Shenzhen Code* became effective immediately upon acceptance of the resolution at the closing plenary session of the XIX IBC on 29 July 2017, that the decisions and appointments of its Nomenclature Section be approved. The *Shenzhen Code* in its final form was published on 26 June 2018 (printed version). This electronic version was made available on 27 June 2018. A [PDF version](#) was made available to members of the [International Association for Plant Taxonomy](#) on 27 January 2019.

Several authorized translations of the *Shenzhen Code* have been made available and can be accessed at <https://www.iaptglobal.org/shenzhen-code>. Note that in questions about the meaning of provisions in translated editions of this *Code*, the English edition is definitive. Automatic translations, such as those provided by some web browsers, may be inaccurate and should not be relied upon.

Provisions of the *Code* relating solely to names of fungi are gathered together in its [Chapter F](#). The content of Chapter F may be modified by action of the Fungal Nomenclature Session of an International Mycological Congress (IMC). Chapter F was revised as a result of decisions approved on 21 July 2018 by the closing plenary session of the 11th IMC, held in San Juan, Puerto Rico. The resulting [San Juan Chapter F](#) was published in the journal *IMA Fungus* on 27 December 2019.

Madrid code

- Latest edition of the International Code of Nomenclature for Algae, Fungi and Plants
- Adopted at 20th International Botanical Congress in Madrid, Spain
- July 2024
- Code includes,
- Voluntary registration mechanism- establishes a system for voluntary registration of plant and algal names, enhancing nomenclatural stability and discoverability
- Clarifications on fossil taxa- provides clearer guidelines for naming and typifying fossil taxa, reducing ambiguity and confusion
- Rejection of derogatory names- introduces a mechanism to reject new names considered derogatory to groups of people, promoting inclusivity and respect
- Name spelling changes- replaces certain epithets deemed offensive with revised spellings (eg. *Afra*, *afrorum* and *afrum*)
- Improved format and clarity- features a recognized structure with complex rules divided into separate clauses, enhancing readability and usability
- Governance updates- includes changes to institutional voting procedures, ensuring equality among institutions
- Effective date- the amendments took effect on July 27, 2024, with the new edition published on July 21, 2025



<https://www.iaptglobal.org/madrid-code-online>


[About](#)
[Grants](#)
[Nomenclature](#)
[Publications](#)
[TAXON](#)
[News](#)
[My IAPT](#)
[IAPT Member Log In](#) [Login help](#)

[About this image](#)

MADRID CODE ONLINE



The International Code of Nomenclature for algae, fungi, and plants, known as "the Code," is the set of internationally agreed rules and recommendations that govern the naming of these organisms.

This is the interactive, online edition of the *Madrid Code*.

The *Madrid Code* is the current edition of the Code and reflects the decisions made at the Twentieth International Botanical Congress held in Madrid, Spain, in July 2024.

The [print edition](#) of the *Madrid Code* was published by the University of Chicago Press on 21 July 2025 as volume 162 of IAPT's book series *Regnum Vegetabile*.

[Madrid Code Online](#)

Principle of ICBN

The International Code of Botanical Nomenclature is based on the following set of 6 principles, which are the philosophical basis of the Code and provide guidelines for the taxonomists who propose amendments or deliberate on the suggestions for modification of the code

- 1. Botanical Nomenclature is independent of Zoological Nomenclature. The code applies equally to the names of taxonomic groups treated as plants whether or not these groups were originally treated**
- 2. The application of names of taxonomic groups determined by means of nomenclatural types**
- 3. Nomenclature of a taxonomic group is based upon priority of publication**
- 4. Each taxonomic group with a particular circumscription, position and rank can bear only one correct name, the earliest that is in accordance with the rules**
- 5. Scientific names of taxonomic groups are treated as Latin, regardless of derivation**
- 6. The rules of nomenclature are retroactive, unless expressly limited**

Ranks of Taxa



Kingdom(**regnum**)

Phylum(**divisio, phylum**)

Class(**classis**)

Order(**ordo**)

Family(**familia**)

Genus

Species

- **Taxon-** refers to a taxonomic group belonging to any rank
- The system of nomenclature provides a hierarchical arrangement of ranks
- Every plant mistreated as belonging to a number of taxa, each assigned a particular rank
- Example:
 - Onion belongs to ***Allium cepa*** (Species rank), ***Allium*** (Genus rank), ***Alliaceae*** (Family rank) and so on
- The 7 principal obligatory ranks of taxa in descending sequence are:

Naming of taxa

Ranks and endings provided by ICBN

Rank	Ending	example
Kingdom	-bionta	Chlorobionta
Division	-phyta	Magnoliophyta
Subdivision	-mycota (Fungi)	Eumycota
	-phytina	Pterophytina
	-mycotina (Fungi)	Eumycotina
Class	-opsida	Magnoliopsida
	-phyceae (Algae)	Chlorophyceae
	-mycetes (Fungi)	Basidiomycetes
Subclass	-opsidae	Pteropsidae
	-idae (Seed plants)	Rosidae
	--physidae (Algae)	Cyanophysidae
	-mycetidae (Fungi)	basidiomycetidae
Order	-ales	Rosales
Suborder	-ineae	Rosineae
Family	-aceae	Rosaceae
Subfamily	-oideae	Rosoideae
Tribe	-eae	Roseae
Subtribe	-inae	Rosinae

Ranks and endings provided by ICBN

Rank	Ending	example
Genus Subgenus Section Subsection Series	-us, -um, -is, -a, -on	<i>Pyrus, Allium, Arabis, Rosa, Polypogon</i> <i>Cuscuta subgenus Eucuscuta</i> <i>Scrophularia section</i> <i>Anastomosanthes</i> <i>Scrophularia subsection Vernales</i> <i>Scrophularia series Lateriflorae</i>
Species Subspecies Varietas Forma		<i>Rosa canina</i> <i>Crepis sancta subsp. bifida</i> <i>Lantana camara var. varia</i> <i>Tectona grandis f. punctata</i>

Genus Taxa

- Generic name is a uninomial singular word treated as a noun
- The genus may have a masculine, neuter or feminine form as indicated by the endings:
 - **-us, -pogon** (commonly stands for masculine genera)
 - **-um** (for neuter)
 - **-a, -is** (for feminine genera)
- The first letter of the generic name is always capitalized
- The name be based on any source, but the common sources for generic names are:
 - **Commemoration of a person:** Ex. ***Benthamida*** for Bentham, ***Darwinia*** for Darwin, ***Linnaea*** for Linnaeus
 - **Based on a place:** Ex. ***Salvadora*** (for EL Salvadore), ***Arabis*** (for Arabia)
 - **Based on an important character:** Ex. Liver like leaves in ***Hepatica***, Marshy habit of ***Hygrophila***, trifoliate leaves of ***Trifolium***
 - **Aboriginal names:** taken directly from a language other than Latin without alteration of ending. Ex. ***Narcissus*** (Greek name for Daffodils named after the famous Greek god Narcissus), ***Vanda*** a Sanskrit name

Species Taxa

- The name of a species is a binomial
- Consisting of two words, a generic name followed by a specific epithet
- The code recommends that all specific epithets should begin with lower case initial letter
- A specific epithet may be derived from any sources or composed arbitrarily. The common sources of specific epithet are:
 - **Name of a person:** Ex. Letter *–i* is added for a male person (*roylei* after Royle) and *–ae* for female person (*laceae* after Lace) and *–orum* for more than one persons with the same surname (*hookerorum* after Hooker & Hooker) and more
 - **Character:** white plant part- *alba* (*Rosa alba*), cultivated plant- *sativus/sativa/sativum* (*Oryza sativa*), two color- *bicolor*, creeping- *repens*
 - **Noun in apposition:** a specific epithet may sometimes be a noun in apposition carrying its own gender and usually in the nominative case. Binomial *Pyrus malus* is based on the Greek name malus for common apple

Tables showing Species taxa names and alternatives

Table a

Person	Sex	Specific epithet	Binomial
Royle	M	<i>roylei</i>	<i>Impatiens roylei</i>
Hooker	M	<i>hookeri</i>	<i>Iris hookeri</i>
Sengupta	M	<i>senguptae</i>	<i>Euphorbia senguptae</i>
Wallich	M	<i>wallichii</i>	<i>Euphorbia wallichii</i>
Todd	F	<i>toddiae</i>	<i>Rosa toddiae</i>
Gepp & Gepp	M	<i>geppiorum</i>	<i>Codiaeum geppiorum</i>
Linnaeus	M	<i>linnaei</i>	<i>Indigofera linnaei</i>

Table b

Author	Genus	Gender	Specific epithet	Binomial
Webb	<i>Rosa</i>	Feminine	<i>webbiana</i>	<i>Rosa webbiana</i>
Webb	<i>Delphinium</i>	Neuter	<i>webbianum</i>	<i>Rheum webbianum</i>
Webb	<i>Astragalus</i>	Masculine	<i>webbianus</i>	<i>Astragalus webbianus</i>
Kotschy	<i>Hieracium</i>	Neuter	<i>kotschyanum</i>	<i>Hieracium kotschyanum</i>
Lagasca	<i>Centaurea</i>	Feminine	<i>lagascana</i>	<i>Centaurea lagascana</i>

Table c

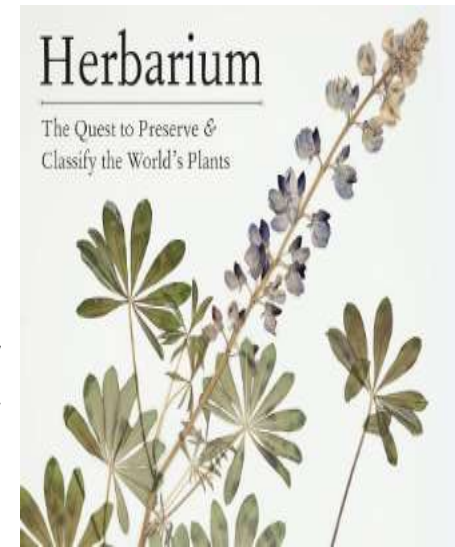
Place	Genus	Gender	Specific epithet	Binomial
Kashmir	<i>Iris</i>	Feminine	<i>kashmiriana</i>	<i>Iris kashmiriana</i>
	<i>Delphinium</i>	Neuter	<i>kashmirianum</i>	<i>Delphinium kashmirianum</i>
	<i>Tragopogon</i>	Masculine	<i>kashmirianus</i>	<i>Tragopogon kashmirianus</i>
India	<i>Rosa</i>	Feminine	<i>indica</i>	<i>Rosa indica</i>
	<i>Solanum</i>	Neuter	<i>indicum</i>	<i>Solanum indicum</i>
	<i>Euonymus</i>	Masculine	<i>indicus</i>	<i>Euonymus indicus</i>

Infraspecific Taxa

- The names of subspecies are trinomials
- Formed by adding a subspecific epithet to the name of a species
- Ex.. ***Angelica archangelica ssp. himalaica***
- A variety (varietal) within a subspecies may accordingly be quadrinomial (Ex. ***Bupleurum falcatum ssp. eufalcatum var. hoffmeisteri***) or it may be just trinomial when no subspecies is recognized within a species (Ex. ***Brassica oleracea var. capitata***)
- A forma may also be assigned a name in a similar manner (Ex. ***Prunus cornuta forma villosa***)
- Infraspecific name may sometimes be a polynomial (Ex. ***Saxifraga aizoon var. aizoon subvar. brevifolia f. multicaulis subf. surculosa Engl. & Irmsch***)

The Type method

- The names of different taxonomic groups are based on Type method, by which certain representative of the group is the source of the name for the group
- This representative is called the Nomenclatural type or simply the Type and methodology is called **Typifications**
- The type need not to be the most typical member of the group, it only fixes the name of a particular taxon and the two are permanently associated
- Type may be correct name or even a synonym
- Ex. Tea family name (**Theaceae**) is derived from synonym **Thea** although the correct name for the genus is **Camellia**; **Mimosa** is the type for family **Mimosaceae**, but unlike most representatives of the family that have pentamerous flowers, the genus **Mimosa** has tetramerous flowers
- The type of a name of a species or infraspecific taxon, where it exists, is single type specimen, preserved in a known herbarium and identified by the place of collection, name of the collector and his collection number
- It may also be an illustration of the plant
- The code recognizes several kind of type, depending upon the way in which a type specimen is selected



Holotype

One specimen/ illustration upon which name is based

Isotype

Duplicate specimen of holotype, collected at the same time by the same person from the same population

Lectotype

Specimen that is selected from original material to serve as the type when no holotype was designated at the time of publication

Syntype

Any one of the 2 or more specimens cited by author when no holotype was designated, or any one of the two or more specimens simultaneously designated as types

Paratype

Specimen cited in the protologue that is neither the holotype nor an isotype, nor one of the syntypes, if 2 or more specimens were simultaneously designated as types

Neotype

Specimen later selected to serve as the single type specimen when an original holotype has been lost/destroyed, or where the original author never cited a specimen

Epitype

Specimen/ illustration selected to serve as an interpretative type when the holotype, lectotype or previously designated neotype, or all original material associated with validly published name, is demonstrably ambiguous and cannot be critically identified for purposes of the precise application of the name of a taxon

Topotype

Name given to a specimen collected from the same locality from which the holotype was originally collected



Author citation

- For a name to be complete, accurate and readily verifiable, it should be accompanied by the name of the author or authors who first published the name validly
- The names of the authors are commonly abbreviated
- Ex. **L.** for Carolus Linnaeus, **Benth.** for Bentham, **Hook.** for William Hooker, **Hook.f.** for Sir J.D. Hooker (f. stands for filius, the son), **Lam.** for J.P. Lamarck
- **Single author:** The name of a single author follows the name of a species (or any other taxon) when a single author proposed a new name Ex. ***Solanum nigrum* L.**
- **Multiple authors:** The names of two or more authors may be associated with a name for a variety of reasons.
- These different situations are exhibited by citing the name of the authors differently:
 1. ***Use of et***
 2. ***Use of parentheses***
 3. ***Use of ex***
 4. ***Use of in***
 5. ***Use of emend***
 6. ***Use of square brackets***

Use of et:

When two or more authors publish a new species or propose a new name, their names are linked by **et**,

Ex. ***Delphinium viscosum* Hook.f. et Thomson.**

Use of parentheses:

Whenever the name of a taxon is changed by the transfer from one genus to another, or by upgrading or downgrading the level of the taxon, the original epithet should be retained. The name of the taxon providing the epithet is termed a **basionym**. The name of the original author or authors whose epithet is being used in the changed name is placed within parentheses, and the author or authors who made the name change outside the parentheses, Ex. ***Cynodon dactylon* (Linn.) Pers., based on the basionym *Panicum dactylon* Linn.,** the original name for the species.

Use of ex:

The names of two authors are linked by **ex** when the first author had proposed a name but was validly published only by the second author, the first author failing to satisfy all or some of the requirements of the Code, Ex. ***Cerasus cornuta* Wall. ex Royle**

Use of in:

The names of authors are linked using **in** when the first author published a new species or a name in a publication of another author, Ex. ***Carex kashmirensis* Clarke in Hook.f. Clarke** published this new species in the *Flora of British India* whose author was Sir J. D. Hooker.

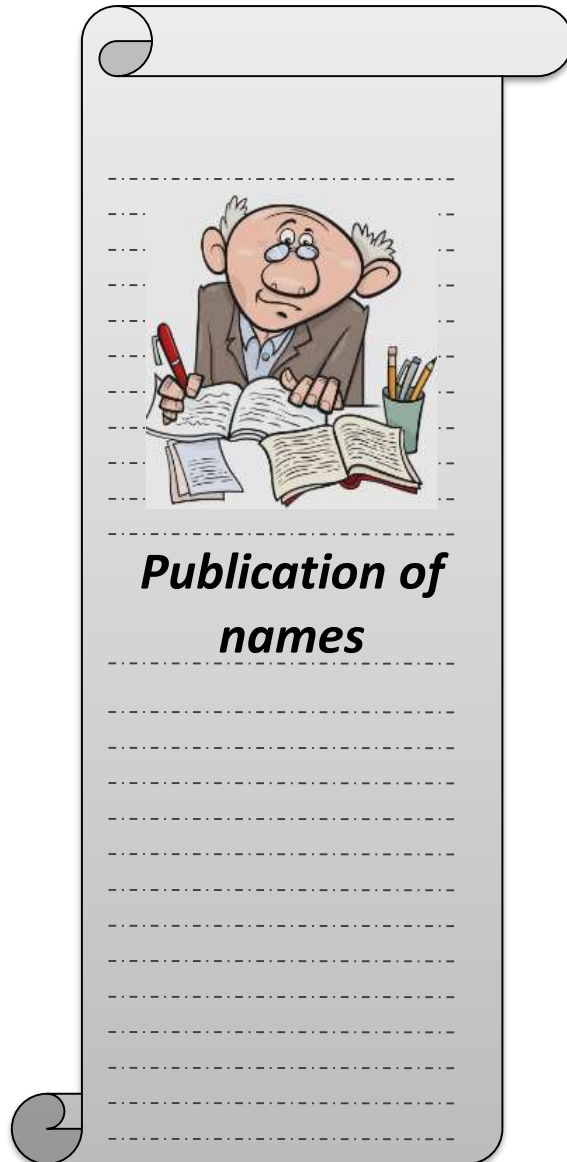
Use of emend:

The names of two authors are linked using **emend.** (**emendavit: person making the correction**) when the second author makes some changes in the **diagnosis or in circumscription** of a taxon without altering the type, Ex. ***Phyllanthus* Linn. emend. Mull.**

Use of square brackets:

Square brackets are used to indicate prestarting point author. The generic name ***Lupinus*** was effectively published by Tournefort in 1719, but as it happens to be earlier than 1753, the starting date for botanical nomenclature based on *Species plantarum* of Linnaeus, the appropriate citation for the genus is ***Lupinus* [Tourne.] L.**

The valid publication should satisfy the following requirements:



Publication of names

Formulation

The name should be properly formulated and its nature indicated by a proper abbreviation after the name of the author



Latin diagnosis

Names of all new species should have a Latin diagnosis (Latin translation of diagnostic features)



Typifications

Name of new taxon should indicated with the type of name

Formulation:

sp. nov.	species nova A species new to science	<i>Tragopogon kashmirianus</i> G. Singh, <i>sp. nov.</i> (published in 1976).
comb. nov.	Combinatio nova A name change involving the epithet of the basionym	<i>Vallisneria natans</i> (Lour.) Hara <i>comb. nov.</i> (published in 1974 based on <i>Physkium natans</i> Lour., 1790).
com. et. stat. nov.	Combinatio et status nova When a new combination also involves the change of status	<i>Caragana opulens</i> Kom. var. <i>Licentiana</i> (Hand.-Mazz.) Yakovl. <i>comb. et stat. nov.</i> (published in 1988 based on <i>C. licentiana</i> Hand.-Mazz., 1933; new combination also involved change of status from a species <i>C. licentiana</i> to a variety of <i>Caragana opulens</i> Kom.).
nom. nov.	Nomen novum When the original name is replaced and its epithet cannot be used in the new name	<i>Myrcia lucida</i> McVaugh <i>nom. nov.</i> (published in 1969 to replace <i>M. laevis</i> O. Berg, 1862, an illegitimate homonym of <i>M. laevis</i> G. Don, 1832).

Latin diagnosis:

- Names of all new species (or other taxa new to science) published 1 January 1935 onwards should have a Latin Diagnosis (Latin translation of diagnostic features)
- Full description of the species in any language can accompany the Latin diagnosis
- A description in any language, not accompanied by a Latin diagnosis is allowed for publications before 1 January 1935
- For publications before 1 January 1908, an illustration with analysis without any accompanying description is valid
- Thus description in any language is essential
- For name changes or new names of already known species, a full reference to the original publication should be made

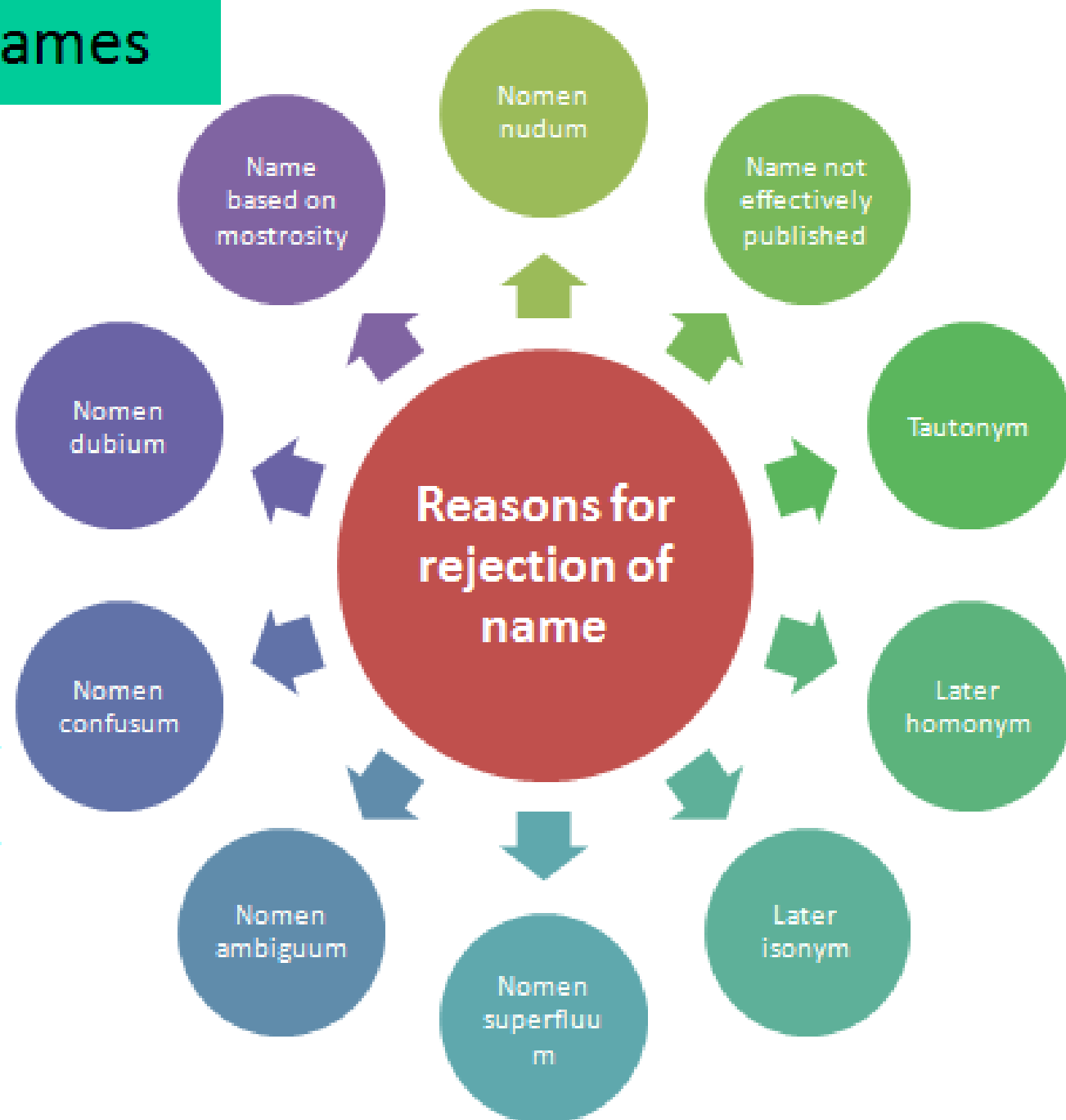
Typification:

- A holotype should be designated
- Publication on or after 1 January 1958 of the name of a new taxon of the rank of genus or below is valid only when the type of the name is indicated
- An indication of the type must include one of the words 'typus' or 'holotypus' or its abbreviation, or even its equivalent in a modern language
- For the name of a new species or infraspecific taxon published on or after 1 January 1990 whose type is a specimen / unpublished illustration, the herbarium or institution in which the type is conserved must be specified
- For lectotypification or neotypification of a name of a species or infraspecific taxon terms 'lectotypus' or 'neotypus' should be indicated



Rejection of names

- The process of selection of correct name for a taxon involves the identification of illegitimate names, those which do not satisfy the rules of botanical nomenclature
- A legitimate name must not be rejected merely because it, or its epithet, is inappropriate or disagreeable, or because another is preferable or better known or because it has lost its original meaning



Nomen nudum

- ***nom. nud.***
- A name with no accompanying description
- Ex. Names published by Wallich in his catalogue published in 1812 were nomen nudum

Name not effectively published

- Not properly formulated
- Lacking typifications
- Without a Latin diagnosis is rejected

Tautonym

- Binomials with identical generic and specific epithet are rejected
- Ex. ***Malus malus***
- Repetition of a specific epithet in an infraspecific epithet does not constitute a tautonym but legitimate autonym
- Ex. ***Acacia nilotica ssp. nilotica***

Later homonym

- Same name cannot be used for two different species (or taxa)
- The one published at an earlier date- earlier homonym and the later date, later homonym
- The code rejects the later homonym
- Ex. ***Ziziphus jujuba Lam.*** 1789 had long been used as correct name for the cultivated fruit jujube
- Later homonym of related species ***Z. jujuba Mill.*** 1768 is rejected

Later isonym

- When the same name, based on same type, has been published independently at different times by different authors, then only the earliest of these so called isonyms has nomenclatural status, and later isonyms are disregarded
- Ex. Baker (1892) and Christensen (1905) independently published the name ***Alsophila kalbreyeri*** as a substitute for ***A. podophylla* Baker (1891) *non* Hoo. (1857)**
- As published by Christensen, ***Alsophila kalbreyeri*** is a later isonym of ***A. kalbreyeri* Baker**, without nomenclatural status

Nomen superfluum

- ***nom. superfl.***
- Name is illegitimate and must be rejected when it was nomenclaturally superfluous when published i.e. if the taxon to which it was applied- as circumscribed by its author- included the type of a name or epithet which thought to have been adopted under the rules
- Ex. ***Physkium natans* Lour. 1790** thus when transferred to the genus ***Vallisneria***, the epithet ***natans*** should have been retained but de Jussieu used the name ***Vallisneria physkium* Juss. 1826** a name which becomes superfluous and rejected

Nomen ambiguum

- ***nom. ambig.***
- Name is rejected if it is used in a different sense by different authors and has become a source of persistent error
- Ex. ***Rosa villosa* L.** is rejected because it has been applied to several different species and has become a source of errors

Nomen dubium

- ***nom. dub.***
- Name is rejected if it is dubious i.e. it is of uncertain application because it is impossible to establish the taxon to which it should be referred
- Ex. Linnaeus (1753) attributed the name ***Rhinanthus crista-galli*** to a group of several varieties, which he later described under separate names, rejecting the name ***R. crista-galli* L.** several later authors, however, continued to use this name for diverse occasions until Schwarz (1939) finally listed this as nomen dubium and the name was finally rejected

Nomen confusum

- ***nom. confus.***
- Name is rejected if it is based on a type consisting of two or more entirely discordant elements, so that it is difficult to select a satisfactory lectotype
- Ex. Characters of genus ***Actinotinus*** were derived from two genera ***Viburnum*** in the terminal bud of an ***Aesculus*** by a collector. The name ***Actinotinus*** must therefore be abandoned

Name based on monstrosity

- Name is rejected if it is based on a monstrosity
- Ex. Generic name ***Uropedium* Lindl.** 1846 was based on the monstrosity of the species now referred to as ***Phragmidium caudatum* (Lindl.)** Royle 1896
- The generic name ***Uropedium* Lindl.** must therefore be rejected

Principle of priority

- Concerned with the selection of a single correct name of a taxonomic group
- After identifying legitimate and illegitimate names, and rejecting the latter, a correct name has to be selected from among the legitimate ones
- If more than one legitimate names are available for a taxon, the correct name is the earliest legitimate name in the same rank
- For taxa at the species level and below the correct name is either the earliest legitimate name or a combination based on the earliest legitimate basionym, unless the combination becomes a tautonym or later homonym, rendering it illegitimate



3 commonly known binomials for the same species of *Nymphaea* are:

***N. nouchali* Burm.f., 1768** - Selected as correct name (based on earliest date of publication)

***N. acutiloba* DC., 1824,**

***N. stellata* Willd., 1799**

***N. malabarica* Poir., 1798.**

} Synonyms

The citation is written as:

- ***Nymphaea nouchali* Burm.f., 1768**
- ***N. malabarica* Poir., 1798**
- ***N. stellata* Willd., 1799**
- ***N. acutiloba* DC., 1824**

Examples for principle of priority

- Loureiro described a species under the name *Physkium natans* 1790
- Transferred to the genus *Vallisneria* by A L de Jussieu 1826 but ignored epithet natans and instead used a binomial *Vallisneria physkium* a superfluous name
- 2 Asiatic species with independent typification were described under the name *V. gigantea* **Graebner**. 1912 and *V. asiatica* Miki. 1934
- Hara concluded, all these names are synonymous; As no legitimate combination based on *Physkium natans* **Lour.** Existed , he made one- *V. natans* (**Lour.**) **Hara** in 1974
- So the correct name of the species in this case is the most recent name but it is based on the earliest Basionym

The citation is written as:

Vallisneria natans (Lour.) Hara, 1974

- *Physkium natans* **Lour., 1790—Basionym**
- *V. physkium* **Juss., 1826— nom. superfl.**
- *V. gigantea* **Graebner, 1912**
- *V. asiatica* **Miki, 1934**
- *V. spiralis* **auct. (non L., 1753)**

- Common apple first described by Linnaeus as *Pyrus malus* 1753
- Species transferred to genus *Malus* but combination *Malus malus* (Linn.) Britt., 1888 cannot be taken because it becomes tautonym
- The other binomial under *Malus* available for apple is- *M. domestica* **Borkh**, 1803 which is accepted as correct name

The citations is written as:

Malus domestica Borkh

- *Pyrus malus* **Linn., 1753**
- *M. malus* (**Linn.**) **Britt., 1888—Tautonym**
- *M. pumila* **auct. (non Mill.)**
- *M. communis* **Desf., 1798— nom.superfl.**

- Almond was first described by Linnaeus under name ***Amygdalus*** communis in 1753
- Miller described another species under the name ***A. dulcis*** in 1768
- The two are now regarded as synonymous
- The genus ***Amygdalus*** was merged with genus ***Prunus*** and the combination ***Prunus communis* (L.) Archangeli** made in 1882 based on the earlier name ***Amygdalus communis* Linn.**
- Webb discovered that ***Prunus communis*** had already been used by Hudson in 1762 for different species rendering ***P. communis* (L.) Archangeli** a later homonym = rejected
- Used next available basionym ***Amygdalus dulcis* Mill., 1768** and made a combination ***Prunus dulcis* (Mill.) Webb, 1967-** correct name for almond

The citation written as:

- ***Prunus dulcis* (Mill.) Webb, 1967**
- ***Amygdalus dulcis* Mill., 1768—**
basionym
- ***A. communis* L., 1753**
- ***P. communis* (L.) Arch.,**
- **1882 (non Huds., 1762)**
- ***P. amygdalus* Batsch, 1801**

Limitations of principle of priority

1. Starting dates

The principle of priority starts with the *Species Plantarum* of Linnaeus published on 1/05/1753

The starting dates for different groups are:

Seed plants, Pteridophytes, <i>Sphagnaceae</i> , <i>Hepaticae</i> , most Algae, Slime moulds and lichens	1/5/1753
Mosses (Excluding <i>Sphagnaceae</i>)	1/1/1801
Fungi	31/12/1820
Fossils	31/12/1820
Algae (<i>Nostocaceae</i>)	1/1/1886
Algae (<i>Oedogoniaceae</i>)	1/1/1900

The publications before these dates for respective groups are ignored while deciding the priority

2. Not above family rank

The Principle of priority is applicable only up to the family rank and not above

3. Not outside the rank

Priority is determined within a specific rank (Ex. Species, Genus, Family) and does not directly affect names at other ranks

If a name is found to be earlier but at different rank, it may not necessarily take priority over the current name

Nomina conservanda (nom. con.)

- Strict application of the principle of priority has resulted in numerous name changes
- To avoid name changes of well- known families or genera especially those containing many species- a list of conserved generic and family names has been prepared and published in the code with relevant changes
- Such ***nomina conservanda*** are to be used as correct names replacing the earlier legitimate names, which are rejected and constitute ***nomina rejicienda*** (***nom. Rejic.***)
- Ex. Family name ***Theaceae D. Don.*** 1825 is thus conserved against ***Ternstroemiaceae Mirbe,*** 1813

Conservation of names of species

- To conserve names of species of major economic importance
- To reduce confusions among agricultural botanists and horticulturists caused due to frequent name changes due to strict application of the principle of priority
- Agreed in Sydney Congress in 1981
- ***Triticum aestivum Linn.*** was the first species name conserved at Berlin Congress in 1987 and published in subsequent code in 1988
- Species names which have been declared ***nomina conservanda*** (each name followed by the (=) sign, indicating taxonomic synonym or a (==) sign, indicating nomenclatural
- Examples:
 - ***Allium ampeloprasum L., 1753 (=) Allium porrum L., 1753***
 - ***Lycopersicon esculentum Mill., 1768 (= =) Lycopersicon lycopersicum (L.) H. Karsen, 1882***

Names of Hybrids

- Hybridity indicated by multiplication sign, or by the addition of prefix '**notho-**' to the term denoting the rank of the taxon, the principle ranks being **nothogenus** and **nothospecies**
- Hybrid between named taxa may be indicated by placing the multiplication sign between the names of the taxa, the whole expression is then called a hybrid formula
- Examples:
 - ***Agrostis* × *Polypogon***
 - ***Agrostis stolonifera* × *Polypogon monspeliensis***
 - ***Salix aurita* × *S. caprea***
- Names or epithets in formula are placed in alphabetical order
- Direction of cross may be indicated by including the sexual symbols (♀ for female; ♂ for male) in the formula or by placing the female parent first
- A hybrid may be either interspecific (between two species belonging to the same genus) or intergeneric (between two species belonging to two different genera)



For interspecific hybrid :

- Binary name may be given to the interspecific hybrids or ***nothospecific*** (if it is self perpetuating and/ or reproductively isolated) by placing the cross sign before the specific epithet as in the following examples(hybrid formula may be added within the parentheses if the parents are established)
- Examples:
 - ***Salix* × *capreola* (*S. aurita* × *S. caprea*)**
 - ***Rosa* × *odorata* (*R. chinensis* × *R. gigantea*)**
- The variants of interspecific hybrids are named ***nothosubspecies*** and ***nothovarieties*** (Ex. ***Salix rubens nothovar. basfordiana***)

- The ***nothogeneric*** names of an intergeneric hybrid derived from four or more genera is formed from the name of a person to which is added the termination **–*ara***; no such name may exceed eight syllables
- Such a name is regarded as condensed formula
- Examples:
 - **×*Potinara* (*Brassavola* × *Cattleya* × *Laelia* × *Sophronitis*)**

For intergeneric hybrid:

- The name is formed as condensed formula by using the first part (or whole) of another genus (but not the whole of both genera)
- Cross sign is placed before the generic name of the hybrid (Ex. ***Triticosecale*** (or × ***Triticosecale***) from ***Triticum*** and ***Secale***)
- Examples:
 - **× *Triticosecale* (*Triticum* × *Secale*)**
 - **×*Pyronia* (*Pyrus* × *Cydonia*)**

Names of cultivated plants



- The names of cultivated plants are governed by the **International Code of Nomenclature for Cultivated Plants (ICNCP)**
- Addition of rank **cultivar (cv.)** for cultivated varieties
- The cultivar name is not written in Italics, it starts with a capital letter
- Is not a Latin but rather a common name
- It is either preceded by cv. As in ***Rosa floribunda* cv. Blessings** or simply within single quotation marks (Ex. ***Rosa floribunda* 'blessings'**)
- May also be named directly under a genus (Ex. ***Hosta* 'Decorata'**) under a hybrid (Ex. ***Rosa* × *paulii* 'Rosea'**) or directly under a common name (Ex. ***Hybrid Tea Rose* 'Red Lion'**)
- Since 1 January 1959 new cultivar names should have a description published in any language and these names must not be same as the botanical or common name of a genus or a species
- Thus cultivar names '**Rose**', '**Onion**' etc are not permitted as the name of a cultivar
- It is recommended that cultivar names be registered with proper registering authorities to prevent duplication or misuse of cultivar names